

WHAT IS CLAIMED IS:

1. An optical receiver comprising:
a first light receiving element to convert an optical signal to an electric signal and to output the electric signal from one end thereof; and
a light receiving element row connected to the other end of said first light receiving element to supply electric power to said first light receiving element, said light receiving element row including a plurality of second light receiving elements connected in series.
2. The optical receiver according to claim 1, further comprising an amplifier circuit connected to the other end of said first light receiving element, said amplifier circuit amplifying the electric signal output from said first light receiving element and outputting the amplified electric signal.
3. The optical receiver according to claim 1, wherein said light receiving element row supplies an electric power to said first light receiving element, said electric power being higher than an electric power which is supplied from an electric power source to said amplifier circuit.
4. The optical receiver according to claim 1, further comprising a light emitting section to apply light to said light receiving element row.
5. The optical receiver according to claim 4, wherein said light emitting section includes a light emitting diode or a laser diode.
6. The optical receiver according to claim 1, further

comprising a capacitor connected in parallel with said light receiving element row.

7. The optical receiver according to claim 1, wherein said light receiving element row and said first light receiving element are formed on a same chip, and said light receiving element row is exposed to an optical signal to generate electric power, said optical signal being received by said first light receiving element.

8. The optical receiver according to claim 2, wherein said light receiving element row, said first light receiving element and said amplifier circuit are formed on a same chip, and said light receiving element row is exposed to an optical signal to generate electric power, said optical signal being received by said first light receiving element.

9. An optical transmitter comprising,
a light emitting element of surface light emission type to convert an electric signal to an optical signal and transmit the optical signal; and
a light receiving element row exposed to light emitted from said light emitting element to generate electric power, said light receiving element row including a plurality of light receiving elements connected in series,
wherein light emitted from a top surface of said light emitting element is used as an optical signal, and said light receiving element row is exposed to light emitted from a rear surface of said light emitting element.

10. The optical transmitter according to claim 9,

further comprising a mirror surface section to reflect a part of light to said light receiving element row, said light being emitted from the top surface of said light emitting element.

11. The optical transmitter according to claim 9, further comprising a capacitor connected in parallel with said light receiving element row.

12. The optical transmitter according to claim 9, further comprising:

a mounting substrate consisting of a conductive material;

a light receiving chip mounted on said mounting substrate, said light receiving chip including said light receiving element row formed therein; and

an optical transmitter chip mounted on said light receiving chip, said optical transmitter chip including said light emitting element formed therein.

13. The optical transmitter according to claim 12, further comprising:

a first electrode provided on said optical transmitter chip, said first electrode being connected to one of electrodes of said light emitting element;

a second electrode provided between said light receiving chip and said light transmitter chip, said second electrode being connected to the other of the electrodes of said light emitting element; and

a third electrode provided on said light receiving chip, said third electrode being connected to one of the electrodes of said light receiving element,

wherein said mounting substrate is connected to the other of the electrodes of said light receiving element.

14. The optical transmitter according to claim 12,

further comprising:

a first electrode provided on said optical transmitter chip, said first electrode being connected to one of electrodes of said light emitting element;

a second electrode provided on said optical transmitter chip, said second electrode being connected to the other of the electrodes of said light emitting element; and

a third electrode provided on said light receiving chip, said third electrode being connected to one of electrodes of said light receiving element,

wherein said mounting substrate is connected to the other of the electrodes of said light receiving element.

15. An optical transceiver comprising:

a light emitting element to convert an electric signal to an optical signal and transmit the optical signal;

a first light receiving element to receive the optical signal and convert the optical signal to an electric signal, then output the electric signal; and

a light receiving element row including a plurality of second light receiving elements connected in series between said light emitting element and said first light receiving element, said light receiving element row being exposed to light emitted from said light emitting element, and thereby said light receiving element row supplying electric power to said first light receiving element.

16. The optical transceiver according to claim 15, further comprising:

a first amplifier circuit having an output terminal connected to said light emitting element, said first amplifier circuit amplifying an electric signal and outputting the amplified electric signal to said light

emitting element; and

a second amplifier circuit having an input terminal connected to said first light receiving element, said second amplifier circuit amplifying an electric signal supplied from said first light receiving element and outputting the amplified electric signal.

17. The optical transceiver according to claim 15, further comprising a capacitor connected in parallel with said light receiving element row.

18. The optical transceiver according to claim 16, further comprising a capacitor connected in parallel with said light receiving element row.

19. The optical transceiver according to claim 15, further comprising:

a mounting substrate comprising a conductive material;

a light receiving chip mounted on said mounting substrate, said light receiving chip including said light receiving element row formed therein; and

an optical transmitter chip mounted on said light receiving chip, said optical transmitter chip including said light emitting element formed therein; and

an optical receiver chip mounted on said light receiving chip so as to be adjacent to said optical transmitter chip and having said first light receiving element formed there, said optical receiver chip being supplied with electric power from said light receiving chip,

wherein at least a material between said light receiving element row and said light emitting element is transparent.

20. The optical transceiver according to claim 19,

further comprising a first electrode connected to one of electrodes of said light receiving element,

wherein said mounting substrate is connected to the other of the electrodes of said light receiving element, and

wherein said optical receiver chip is supplied with electric power from said light receiving chip because of a potential difference between said first electrode and said mounting substrate.

21. The optical transceiver according to claim 16, wherein

an anode of said light emitting element is connected to an output terminal of said first amplifier circuit,

a cathode of said light emitting element is connected to a reference potential,

an anode of said first light receiving element is connected to an input terminal of said second amplifier circuit,

an anode of said light receiving element row is connected to a cathode of said first light receiving element, and

a cathode of said light receiving element row is connected to the reference potential.

22. The optical transceiver according to claim 16, wherein

an anode of said light emitting element is connected to an output terminal of said first amplifier circuit,

a cathode of said light emitting element is connected to a reference potential,

a cathode of said first light receiving element is connected to an input terminal of said second amplifier circuit,

an anode of said light receiving element row is connected to the reference potential, and

a cathode of said light receiving element row is connected to an anode of said first light receiving element.

23. The optical transceiver according to claim 16, wherein said light emitting element, said first light receiving element, said light receiving element row, said first and second amplifier circuits, and said capacitor are formed as one body by using seal resin.